REMARKS

This application has been reviewed in light of the Office Action dated January 22, 2003. Claims 1-6 are pending in this application. Claims 1 and 4, which are the independent claims, have been amended to define more clearly what Applicant regards as the invention, in terms that distinguish over the art of record. Favorable reconsideration is requested.

Claims 1-6 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly not supported by an enabling disclosure. Without conceding the propriety of this rejection, the language, "said diode having an impurity distribution which is uniform along a direction of signal charge transfer," deemed objectionable by the Examiner, has been removed from independent Claims 1 and 4. Accordingly, it is believed that the Section 112, first paragraph, rejection has been overcome and its withdrawal is therefore respectfully requested.

Claims 1-6 were also rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,139,784 (Sauer). Applicant submits that amended independent Claims 1 and 4, together with the remaining dependent claims, are patentably distinct from Sauer for at least the following reasons.

Claim 1 requires a charge transfer apparatus including a semiconductor region, a charge transfer region, a signal charge input portion, a signal charge output portion, and a plurality of independent potential supply portions. The semiconductor region is of one conductivity type and the charge transfer region is of a conductivity type opposite to the conductivity type of the semiconductor region. The charge transfer region is formed in the semiconductor region and joined to the semiconductor region to form a

diode. The signal charge input portion is adapted to input a signal charge to the charge transfer region, and the signal charge output portion is adapted to accumulate the signal charge transferred from the charge transfer region. The plurality of independent potential supply portions are adapted to supply a potential gradient to the semiconductor region. The plurality of independent potential supply portions supply the semiconductor region with respectively different potentials, and the plurality of independent potential supply portions are ohmically connected to each other through the semiconductor region. The signal charge in the charge transfer region is transferred by the potential gradient formed by the plurality of potential supply portions, and the signal charge in the charge transfer region is transferred by drift over all of the charge transfer region.

Notable features of Claim 1 include the plurality of independent potential supply portions ohmically connected to each other through the semiconductor region, wherein the signal charge in the charge transfer region is transferred by the potential gradient formed by the plurality of independent potential supply portions. Support for these features can be found in the specification and drawings as originally filed, at least in Figures 5, 9, and 10, which show the potential supplying portions 13 and 15 connected through resistor 27. With such an arrangement, the semiconductor resistor 27 can be set at a higher resistance than a resistance of a gate electrode of a CCD, thereby allowing greater current to be supplied to the potential supplying portions and forming a greater potential gradient. This has the effect of significantly increasing the signal transfer speed. Further support can be found in Figures 2A-2E, and from page 11, line 8 to page 14, line 27. (It is to be understood, of course, that the scope of Claim 1 is not limited to the details of these embodiments, which are referred to only for purposes of illustration.)

In rejecting Claim 1, the Office Action refers to Figure 7 of Sauer as allegedly disclosing "a semiconductor region (N-TYPE Si)" and "a plurality of independent potential supply portions (V_s and V_c) . . . ." (See page 3 of the Office Action). However, V_c is understood merely to *measure* the voltage of the floating diffusion FD, which is an input to the differential amplifier 38a (see col. 5, lines 41-48). V_c is not understood to be a potential *supplying* portion used to form a potential gradient to transfer charge, as required in Claim 1. In other words, V_c is understood to provide a passive potential measurement function, instead of actively supplying a potential. Additionally, Applicant also submits that V_s and V_c are not ohmically connected to each other through the semiconductor region.

Accordingly, Applicant believes that nothing in Sauer would teach or suggest to a person having ordinary skill in the relevant art, the plurality of independent potential supply portions ohmically connected to each other through the semiconductor region, wherein the signal charge in the charge transfer region is transferred by the potential gradient formed by the plurality of independent potential supply portions, as recited in Claim 1. For these reasons, Applicant submits that Claim 1 is patentable over Sauer and respectfully requests withdrawal of the corresponding Section 102(b) rejection.

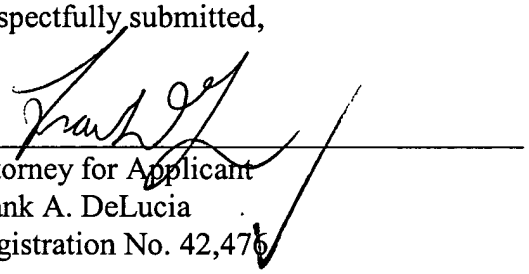
Independent Claim 4 includes features similar to those just described in connection with Claim 1 and is also believed to be patentable over Sauer for at least the same reasons.

The other rejected claims in this application depend from one or another of the independent claims discussed above and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and the allowance of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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